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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/532,709

04/27/2005

Takeshi Kawai

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03/13/2008

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EXAMINER

KEYS, ROSALYND ANN

ART UNIT

PAPER NUMBER

1621

MAIL DATE

DELIVERY MODE

03/13/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/532,709

Applicant(s)

KAWAI ET AL.

Examiner

ROSALYND KEYS

Art Unit

1621

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-11 and 13-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-11 and 13-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Status of Claims

1. Claims 1-5, 7-11 and 13-22 are pending.
Claims 1-5, 7-11 and 13-22 are rejected.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 18, 2008 has been entered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

This claim is indefinite because it depends from a cancelled claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject

matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-5, 7-11, and 13-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olah (US 3,766,286) in view of Frey (US 2,372,320).

Olah teach isomerization of alkyl substituted aromatic hydrocarbons in the presence of a catalyst composition comprising a Lewis acid and Bronsted acid (see entire disclosure, in particular column 1, line 70 to column 4, line 44).

Olah differs from the instant invention in that Olah does not disclose the preparation of the feedstock for his reaction.

Frey discloses a process for the alkylation of hydrocarbons, in particular benzene, in the presence of HF (see entire disclosure, in particular page 2, left column, lines 13-60 and page 3, right column, line 22 to page 4, left column, line 43).

One having ordinary skill in the art at the time the invention was made would have found it obvious to prepare the alkyl benzenes of Frey in the process of Olah, since Frey teaches that his alkyl benzenes are suitable as raw materials for various chemical processes and Olah teaches that any alkyl substituted aromatic hydrocarbon is suitable as a feedstock in his process.

One having ordinary skill in the art at the time the invention was made would have been motivated to make the alkyl benzenes of Olah by the method of Frey, since Frey teaches that hydrofluoric acid is an excellent catalyst for the alkylation of benzene and that it is particularly advantageous in the production of ethyl benzene (see page 3, column 2, lines 22-40).

Olah further differ from the instant claims in the molar ratio of Brønsted acid to the aromatic compound, the mole ratio of olefin to aromatic compound, and the preferred temperature range for alkylation.

One having ordinary skill in the art at the time the invention was made would have found it obvious to modify these parameters in order to determine the optimum reaction conditions, in particular since the time of contact, temperature and mole ratio of reactants are all known to effect the yield and placement of alkyl groups on the desired alkylation product. Further, changes in temperature, concentrations, or other process conditions of an old process do not impart patentability unless the recited ranges are critical, i.e., they produce a new and unexpected result. *In re Aller et al.*, (CCPA 1955) 220 F.2d 454, 105 USPQ 233.

Olah in view of Frey further differ from the claims in that they do not teach carrying out the alkylation and isomerization in the same single reaction chamber. One having ordinary skill in the art at the time the invention was made would have been motivated to carrying out the alkylation and isomerization steps in one reaction vessel, in the absence of unexpected results, as this would save both time and equipment.

Response to Arguments

Rejection of claims 1-5, 7-11 and 13-21 under 35 U.S.C. 103(a) as being unpatentable over Lien et al. (US 2,868,854) in view of Frey (US 2,372,320)

9. This rejection is withdrawn, since it is cumulative. See MPEP 706.02 (Merely cumulative rejections, i.e., those which would clearly fall if the primary rejection were not sustained, should be avoided).

Rejection of claims 1-5, 7-11, and 13-21 under 35 U.S.C. 103(a) as being unpatentable over Olah (US 3,766,286) in view of Frey (US 2,372,320)

10. Applicant's arguments filed December 26, 2007 have been fully considered but they are not persuasive.

11. The Applicants submit that one of ordinary skill in the art concerned with in Olah, pertaining to an isomerization reaction, would not have looked to the teachings of Frey; in particular, there would have been no motivation from the combined teachings of these references, or in any other manner to one of ordinary skill in the art, to motivate the combination of the teachings of these references. It is respectfully submitted that only through hindsight use of Applicants' disclosure, which is improper under 35 USC 103, would one have combined the teachings of Olah and Frey, as applied by the Examiner. The Examiner disagrees. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the instant case both the alkylation

process and the isomerization process were known from the prior art, namely Frey teaches the alkylation process and Olah teaches the isomerization process. The Examiner believes that one having ordinary skill in the art would have combined the teachings of Olah, with the teachings of Frey because Frey produces the starting material used in the isomerization of Olah, in particular Frey produces alkyl aromatics (see entire disclosure) and Olah uses alkyl aromatics in their isomerization process (see entire disclosure). Thus, one having ordinary skill in the art would have found it obvious to combine the teachings of Frey and Olah, since the product produced by Frey is a suitable starting material in the process of Olah. The instant claims are *prima facie* obvious over the combination of Frey and Olah, since in combination these references teach each and every element of the claimed invention, including the newly added limitation wherein the alkylation is conducted without the presence of a Lewis acid. For the above reasons, this rejection is maintained.

Applicants submit that that Comparative Examples 1-7 correspond to the procedure described in Frey, et al., discussed *infra*; and that Comparative Example 8 compares to the processes in Lien, et al. and Olah, discussed *infra*, in which an isomerization is carried out under the presence of HF and BF₃. Thus, it is respectfully submitted that the Examples and Comparative provide a comparison with the closest prior art. The Examiner disagrees. In Comparative Examples 1-7 the alkylation is carried out in the presence of BF₃. However, the alkylation process of Frey et al. is not conducted in the presence of BF₃, in fact Frey et al. teach that the preferred alkylation catalyst is hydrofluoric acid (see column 1, line 50 to column 2, line 27). In Comparative Example 8 BF₃ is not used in the isomerization process, whereas Lien et al. teach the combination of HF and BF₃ (see entire disclosure, in particular column 1, lines 58-71) and Olah teach the use of a combination of a Lewis acid and a Bronsted acid for the isomerization (see entire disclosure, in particular column 2, line 25 to column 3, line 10). Thus, the Comparative Examples 1-7 do not correspond to Frey et al. and Comparative Example 8 does not correspond

to Lien et al. and Olah. Thus, the comparative examples in the specification do not represent a comparison with the closest prior art and thus are not sufficient to overcome the prima facie obvious rejection.

The Applicants argue that Frey teaches away from the presently claimed process. This argument is not persuasive because in view of the whole reference of Frey the skilled artisan would reasonably conclude that the teachings of Frey are applicable to other alkylatable hydrocarbons including benzene, toluene or isoparaffins (see entire disclosure, in particular column 1, lines 1-2; column 2, lines 33 and 34; column 3, lines 13-19, claim 1 and claim 9).

The Applicants argue that in light of the combined teachings of Olah with Frey, and for simplification of processing, one of ordinary skill in the art would have conducted the alkylation in the copresence of the Brønsted acid and the Lewis acid. This argument is unpersuasive because it does not negate the fact that Frey teaches that it is known to carry out the alkylation with HF alone.

For the above reasons the claims are unpatentable.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. McCaulay et al. (US 2,766,307) teach preparing monoalkylxylenes by alkylation.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROSALYN D KEYS whose telephone number is 571-272-0639. The examiner can normally be reached on M, R & F 5:30-7:30 am & 1-5 pm; T & W 5:30 am-4 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ROSALYND KEYS/
Primary Examiner, Art Unit 1621

March 3, 2008